

Abstract

A method for inspecting semiconductor wafers is provided in which a plurality of independent, low-cost, optical-inspection subsystems are packaged and integrated to simultaneously perform parallel inspections of portions of the wafer, the wafer location relative to the inspection being controlled so that the entire wafer is imaged by the system of optical subsystems in a raster-scan mode. A monochromatic coherent-light source illuminates the wafer surface. A darkfield-optical system collects scattered light and filters patterns produced by valid periodic wafer structures using Fourier filtering. The filtered light is processed by general purpose digital-signal processors. Image subtraction methods are used to detect wafer defects, which are reported to a main computer to aid in statistical process control, particularly for manufacturing equipment.